

# SWOSU Students Attend Impressive Tour of California NASA Facilities

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Southwestern Oklahoma State University students Nicolas Barton and Oveta Lira (second and third from left), both of Clinton, are shown in front of Space X in Los Angeles. The pair were recently selected for an impressive tour of several NASA sites in California. Accompanying them on the trip were SWOSU faculty (left) Dr. Richard Baugher and Madeline Baugher (right).

Southwestern Oklahoma State students Nicolas Barton and Oveta Lira, both of Clinton, were recently selected for an impressive tour of several NASA sites in California.

The pair visited the Jet Propulsion Laboratory (JPL) in Pasadena (CA), Dryden Flight Research Center at Edwards Air Force Base in Mojave (CA) and Space X in Los Angeles.

Madeline Baugher, instructor in the SWOSU Department of Entrepreneurship and Computing Systems, worked in conjunction with Dr. Henrietta Mann, president of the Cheyenne and Arapaho Tribal College, and the Oklahoma NASA Space Grant program to allow Native American students to participate in an Introduction to Robotics course in the 2008/2009 spring semester. The top students were selected for the trip to California.

The Jet Propulsion Laboratory is set on 177 acres of beautifully landscaped rolling foothills of La Canada near the San Gabriel Mountains in Pasadena. It is comprised of 134 buildings and 57 trailers. JPL has been involved in a variety of space research and exploration projects since its establishment by the California Institute of Technology in the 1930's. JPL works on a 1.5 billion dollar budget base and has 5,000 employees. It works closely with Caltech under five-year research contracts.

Lira said the research that takes place at this facility is awesome. JPL is known for its end to end implementation of unprecedented robotic space missions. These robotic missions include the in-depth study of the planet Mars to see if life is or was ever sustainable on that planet, the study of the rings and moons of Saturn, the study of asteroids, cloud formations, the ocean, comets, and many more studies. During the tour, the most significant testing was a chance to witness how researchers are testing different ways to program the Spirit Rover to dig itself out of the flour-like sand trap where it is currently stuck in a crater on Mars. Even though the Spirit Rover is stuck in the sand, it is still able to take photos and send back soil data to the labs on earth for analysis. More information these missions are available at <http://www.nasa.gov/missions/index.cfm>.

The next stop on the tour was Dryden Flight Research Center. Located in the Mojave Desert, this facility is where the most up-to-date aeronautical research and development take place. Hangar 703 is home to several of the science aircraft laboratories currently being developed. The SOFIA, the acronym for Stratospheric Observatory for Infrared Astronomy, will be working in conjunction with the Hubble, Spitzer, Herschel and James Webb space telescopes. This aircraft will be able to fly up to 45,000 feet and

take infrared pictures of the universe that will allow scientists and researchers to track the birth and death of stars, see what is in the dust of comets, asteroids and around planets.

Also housed at Hangar 703 is the DC-8 flying science laboratory. This aircraft flies at flight altitude and collects data sent from satellites that is used in a number of studies about the earth's surface, oceans and atmosphere. New flight instruments are tested on this aircraft and modifications can be made to these instruments before they are used in different aircraft or sent out into space. The information gathered by satellites and sent to the DC-8 is very vital to researchers not only here in the United States, but in other countries as well. This information will help researchers to track weather conditions, ozone levels, helps to better detect hurricanes, tornadoes and other catastrophic natural disasters before they happen.

The SOFIA and the DC-8 are just two of the aircraft being developed at Dryden. Others include the Global Hawk that will be able to fly unmanned at higher altitudes for periods up to 30 hours and will help researchers to study remote locations on earth that are not easily accessible by piloted aircraft.

Barton got the opportunity to fly a simulation of the F-18 fighter jet. There are many other flight research projects that are going on at Dryden.

The last stop of the tour was to Space X in Hawthorne. This new private space technology company was opened in 2002 by Elon Musk, who is the CEO and one of the co-founders of PayPal and the Zip2 Corporation. Their mission is to further develop space rockets and manned spacecraft vehicles while still maintaining quality, reliability and cost efficiency by cutting manufacturing costs by a factor of ten. They are housed near the Los Angeles International Airport.

"It was very impressive to see a rocket being built from the ground up all in one facility," Lira said.

Space X has already had several successful launches beginning with the first one in March 2006 and the latest one being the Falcon I that launched on July 13, 2009 and carried the RazakSAT satellite into orbit.

Both Barton and Lira said since these NASA research centers are not open to the general public, it was a great opportunity to tour these facilities.

Dr. Richard Baugher from the SWOSU Engineering Technology Department also accompanied the students.